

REMARKS

Claims 15, 17 and 19-26 are pending in this application. By this Amendment, claim 15 is amended. No new matter is added. Reconsideration of the application is respectfully requested.

I. Information Disclosure Statement

An Information Disclosure Statement with Form PTO-1449 was filed in the above-captioned patent application on March 25, 2005. Applicant has not yet received from the Examiner a copy of the Form PTO-1449 initialed to acknowledge the fact that the Examiner has considered the disclosed information. Applicant respectfully requests that the Examiner initial and return to the undersigned a copy of the Form PTO-1449 with the next Office Action. For the convenience of the Examiner, a copy of that form is attached.

II. Rejections Under 35 U.S.C. §103(a)

A. Ozawa in view of Wakimoto

The Office Action rejects claims 15, 17, 19-21, 25 and 26 under 35 U.S.C. §103(a) over U.S. Patent No. 6,618,029 to Ozawa in view of U.S. Patent No. 5,739,635 to Wakimoto. Applicant respectfully traverses the rejection.

Ozawa does not teach or suggest an electroluminescence device including a thin-film layer "being continuously formed so as to cover the light-emitting layer and the bank," as recited in independent claim 15.

Ozawa teaches an electroluminescence display device including a bank defining a plurality of pixels 7. See Fig. 3. Each pixel 7 includes a TFT 30, a pixel electrode 41 provided above the TFT 30, a light emission element 40 provided above the pixel electrode 41, and a common/counter-electrode op continuously formed above the bank and the pixel 7. See Fig. 6A and 6B. However, Ozawa does not teach or suggest a thin-film layer provided above the light emission element 40 and under the common electrode op.

The Office Action admits that Ozawa does not teach or suggest a thin-film layer provided above the light-emitting layer and under the cathode, the thin-film layer being continuously formed so as to cover the plurality of pixels. However, the Office Action asserts that Wakimoto remedies the deficiencies of Ozawa. Specifically, the Office Action asserts that Wakimoto teaches an electroluminescence device including a thin-film layer 6b disposed between a light-emitting layer 3 and a cathode 1. Notwithstanding these assertions, Wakimoto does not remedy the deficiencies of Ozawa.

Wakimoto teaches an organic electroluminescence device including an electron-injecting layer 6b disposed between an emitting layer 3 and a metal cathode 1. See Fig. 3. Wakimoto also teaches that the electron-injecting layer 6b is made of an alkaline metal compound and includes a very low work function so that the electron-injecting layer 6b acts as an insulator. See col. 2, lines 59-67. Although the electron-injecting layer 6b acts as an insulator, the electron-injecting layer 6b has a thickness roughly at 500 angstrom or less to prevent from obstructing electric current in the device. See col. 3, line 8-15. Because the electron-injecting layer 6b is made of metal, the electron-injecting layer 6b is electrically conductive material that is connected to the cathode 1. Thus, short circuiting may still occur.

In the process for manufacturing electroluminescence devices, defects may occur when forming a light-emitting layer using various printing methods. See page 2, lines 5-7. Specifically, portions of the light-emitting layer located in the vicinity of the bank may not be formed which results in a defect in the light-emitting layer. Such a defect may occur due to the adhesion energy between the material of the bank and the material of the light-emitting layer, because the adhesion energy between the bank and the light-emitting layer may not be as hard the adhesion energy between the material of the anode and material of the light-emitting layer. Therefore, the light-emitting layer may not be formed in the peripheral region of the light-emitting layer that is adjacent to the bank. As a result, electrical short circuits

caused by printing defects of the light-emitting layer may result to disable the display. See page 2, lines 7-8 of the specification. Further, unnecessary electron trap levels are formed when the light-emitting layer is joined with the cathode and/or the anode.

In order to address these problems, the electroluminescence device of claim 15 includes a thin-film layer continuously formed so as to cover the light-emitting layer and bank. See Fig. 6. The thin-film layer of claim 15 may be made of fluoride of an oxide of an alkali metal, alkaline earth metal and group III element in the periodic table. See page 3, lines 20-23 of the specification. The thin-film layer may also be provided between the cathode and the light-emitting layer and/or the cathode and the anode. See page 3, line 17 - page 4, line 7 of the specification.

As a result, the thin-film layer may be formed as a shielding so as to cover the area where the defective formation of the light-emitting layer occurs such as the peripheral region of the light-emitting layer located between the light-emitting layer and the bank. Therefore, the anode and the cathode do not electrically contact to cause a short circuit. See page 2, lines 18-21. Further, unnecessary electron trap levels are not formed because the cathode and/or anode no longer contact the light-emitting layer.

Wakimoto does not teach or suggest providing a continuously formed electron-injection layer 6b. Therefore, Wakimoto cannot provide the advantages discussed above. Accordingly, neither Ozawa nor Wakimoto, alone or in combination, teaches or suggests the electroluminescence device of claim 15.

Therefore, claim 15 would not have been rendered obvious by Ozawa in view of Wakimoto. Claims 17, 19-21 and 26 depend from claim 15, and thus also would not have been rendered obvious by Ozawa in view of Wakimoto. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

B. Ozawa in view of Wakimoto, and further in view of Roitman

The Office Action rejects claims 22 and 23 under 35 U.S.C. §103(a) over Ozawa in view of Wakimoto, and further in view of U.S. Patent No. 6,111,356 to Roitman et al. ("Roitman"). Applicant respectfully traverses the rejection.

As discussed above, neither Ozawa nor Wakimoto, alone or in combination, teaches or suggests an electroluminescent device including a thin-film layer "being continuously formed so as to cover the light-emitting layer and the bank," as recited in independent claim 15. Roitman does not remedy such deficiencies of Ozawa and Wakimoto.

Roitman is directed to an organic light emitting device include anodes 13, an insulating-layer 14, polymer light emitting layer 16, and a cathode material 31 deposited through tapered photoresist layers 30 to produce stripes of cathodes 32. See Figs. 4 and 5, col. 3, lines 34-41, and col. 5, lines 63-67. Roitman does not teach or suggest any thin-film layer. For at least these reasons, Roitman, like Mizutani and Wakimoto, does not teach or suggest the electroluminescent device including a continuously formed thin-layer as set forth in claim 15.

Therefore, claim 15 would not have been rendered obvious by Ozawa in view of Wakimoto, and further in view of Roitman. Claims 22 and 23 depend from claim 15, and thus also would not have been rendered obvious by Ozawa in view of Wakimoto, and further in view of Roitman for at least the reasons set forth above as well as for the additional features they recite. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

C. Ozawa in view of Wakimoto, and further in view of JP 10-036487

The Office Action rejects claims 24 under 35 U.S.C. §103(a) over Ozawa in view of Wakimoto, and further in view of Japanese Patent Application Publication No. JP 10-036487. Applicant respectfully traverses the rejection.

As discussed above, neither Ozawa nor Wakimoto, alone or in combination, teaches or suggests an electroluminescent device including a thin-film layer "being continuously formed so as to cover the light-emitting layer and the bank" as recited in independent claim 15. JP 10-036487 does not remedy such deficiencies of Ozawa and Wakimoto.

JP 10-036487 is directed to a fluorine polymer used as a luminescent material of an EL element. See Abstract. JP 10-036487 does not teach or suggest the formation of a thin-film layer. For at least these reasons, JP 10-036487, like Ozawa and Wakimoto, does not teach or suggest an electroluminescent device including a continuously formed thin-film layer as set forth in claim 15.

Therefore, claim 15 would not have been rendered obvious by Ozawa in view of Wakimoto, and further in view of JP 10-036487. Claim 24 depends from claim 15, and thus also would not have been rendered obvious by Ozawa in view of Wakimoto, and further in view of JP 10-036487 for at least the reasons set forth above, as well as for the additional features it recites. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

III. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 15, 17 and 19-26 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned representative at the telephone number set forth below.

Respectfully submitted,



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Attachment:

Request for Continued Examination

Date: June 6, 2005

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